

REMARKS

Claims 1-4, 6-10, 12-16, 18-22, and 24 are pending and stand rejected. Claims 1, 7, 13, and 19 are amended by way of this Amendment to clarify the subject of the invention. All pending claims are believed to be allowable over the references cited by the Examiner as discussed below. Accordingly, a Notice of Allowance for the present application is respectfully requested.

Rejection Under 35 U.S.C. §102(e)

Claims 1-7, 13, 19, and 24 stand rejected under 35 U.S.C. §102(e) as being anticipated by May et al. Applicants respectfully disagree.

Each of the independent claims 1, 7, 13, and 19 is amended to clarify the subject of the invention. For example, each of independent claims 1 and 7 recites a device or system comprising a source of radiation, a spatial light modulator (“SLM”), and a photocathode that receives modulated radiation and simultaneously produces a plurality of electron beams under impact by the modulated radiation as result of the modulation of the radiation by the SLM. Simultaneous generation of a plurality of electron beams results from the modulation of the radiation by the SLM and facilitates in increasing throughput and/or efficiency. This is noted in the specification as filed at, for example, page 1, lines 14-15 and page 8, lines 27-31.

Similarly, each of independent claims 13 and 19 recites a method comprising directing radiation onto an SLM and directing the modulated radiation onto a photocathode to simultaneously produce plurality of electron beams as result of the modulation of the radiation by the SLM.

In contrast, May fails to disclose or suggest such features of the device, system, or method as recited in the rejected claims. For example, the rejected claims recite that the simultaneous production of a plurality of electron beams by the photocathode results from the modulation of the radiation. May, however, directs multiple radiation beams to multiple lenses in a lens array (1) and through corresponding light-modulating cells of the SLM (2) onto the corresponding photoemissive region (9) of the photoemission layer (5). (Col. 4, lines 23-28). It is that multiple optical beams may be directed to multiple cells of the SLM (2) that results in the electron beam output. Note that each of FIGS. 1, 4, and 5 shows an electron beam path for each voltage input, V_{Max} and V_{-Max} , and does not show multiple electron beams simultaneously

generated for each cell of the SLM. In other words, in order for May to read on the claims as amended, the optical beam must be modulated by each cell of the SLM (2) such that the corresponding photoemissive region (9) of the photoemission layer (5) simultaneously generates multiple electron beams, a feature that May neither discloses nor suggests.

In view of the foregoing, withdrawal of the rejection of independent claims 1 and 13 as well as claims dependent variously therefrom under 35 U.S.C. §102(e) is respectfully requested.

Rejections Under 35 U.S.C. §103

Claims 2-4, 6, 8-10, 12, 14-16, 18, 20-22, and 24, dependent variously from independent claims 1, 7, 13, and 19, stand rejected under 35 U.S.C. §103(a) as being unpatentable over May in view of various secondary references. In particular, claims 4, 10, 16, and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over May in view of Engstrom. Claims 2-3, 8-9, 14-15, and 20-21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over May in view of Brandes. In addition, claims 6, 12, 18, and 24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over May in view of Clark.

However, dependent claims 2-4, 6, 8-10, 12, 14-16, 18, 20-22, and 24 are believed to be allowable at least because the independent claims 1, 7, 13, and 19 from which they variously depend are allowable as discussed above.

In view of the foregoing, withdrawal of the rejection of dependent claims 2-4, 6, 8-10, 12, 14-16, 18, 20-22, and 24 under 35 U.S.C. §103(a) is respectfully requested.

Version of Amendments With Markings to Show Changes Made

Please amend claims 1, 7, 13, and 19 as follows:

1. (Twice Amended) A device for generating a plurality of electron beams comprising:
 - e) a source of radiation; [and,]
 - f) a spatial light modulator having a position so as to modulate said radiation emanating from said source of radiation; and[.]
 - g) a photocathode having a position so as to receive said modulated radiation wherein said photocathode simultaneously produces a plurality of electron beams under impact by said modulated radiation as result of said modulation of the radiation by the spatial light modulator.
7. (Twice Amended) An electron beam lithography system comprising:
 - d) a source of radiation; [and,]
 - e) a spatial light modulator having a position so as to modulate said radiation emanating from said source of radiation; [and,]
 - f) a photocathode having a position so as to receive said modulated radiation wherein said photocathode simultaneously produces a plurality of electron beams under impact by said modulated radiation as result of said modulation of the radiation by the spatial light modulator; and[.]
 - h) an electron beam optical column having a position so as to receive said plurality of electron beams and to direct said plurality of electron beams onto a target.
13. (Twice Amended) A method of producing a plurality of electron beams comprising:
 - c) directing radiation onto a spatial light modulator, thereby modulating said radiation; and[.]
 - d) directing said modulated radiation onto a photocathode thereby simultaneously producing a plurality of electron beams as result of said modulation of the radiation by the spatial light modulator.

19. (Twice Amended) A method of performing lithography with multiple breams of electrons comprising:

- d) directing radiation onto a spatial light modulator, thereby modulating said radiation; [and,]
- e) directing said modulated radiation onto a photocathode thereby simultaneously producing a plurality of electron beams as result of said modulation of the radiation by the spatial light modulator; and[,]
- f) directing said plurality of electron beams onto an acceptance region of an electron beam optical column, producing thereby a plurality of electron beams impacting a target located at the target end of said electron beam optical column.

CONCLUSION

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

In the unlikely event that the transmittal letter accompanying this document is separated from this document and the Patent Office determines that an Extension of Time under 37 CFR 1.136 and/or any other relief is required, Applicant hereby petitions for any required relief including Extensions of Time and/or any other relief and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 50-1217 (Order No. AMATP010).

Respectfully submitted,



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